



EBERLINE SERVICES

0061946

October 22, 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352



Reference: P.O. #630
Eberline Services R3-09-029-7577, SDG H2328

Dear Mr. Trent:

Enclosed is the data report for three soil samples designated under SAF No. F03-006 received at Eberline Services on September 4, 2003. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM

Enclosure: Data Package

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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2328 was composed of three soil samples designated under SAF No. F03-006 with a Project Designation of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling. Due to elevated sample activities sample aliquots were reduced.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.5 Iodine-129 Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

Sample B17D45 had a yield of 115% (Limit 105%). The LCS and method blank were not scaled to the nominal aliquot. No other problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.8 Total Uranium Analyses

The LCS was not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

2.12 Gamma Spectroscopy Analyses

The LCS and method blank were not scaled to the nominal aliquot. No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion
Melissa C. Mannion
Program Manager

10/22/13
Date

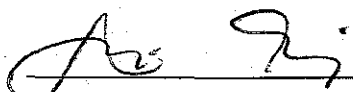
EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2328

SDG 7577
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_H2328

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Prepared by

Melissa Mannion
Reviewed by

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Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2328

SDG 7577
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2328

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

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SAMPLE DELIVERY GROUP H2328

SDG 7577
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2328

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

SDG 7577

Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford

Contract No. 630

Case no SDG H2328

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R309029-01	B17D43	216-A-36B	SOLID		F03-006	F03-006-239	07/07/03 07:06
R309029-02	B17D44	216-A-36B	SOLID		F03-006	F03-006-239	07/29/03 08:00
R309029-03	B17D45	216-A-36B	SOLID		F03-006	F03-006-239	07/29/03 09:15
R309029-04	Lab Control Sample		SOLID		F03-006		
R309029-05	Method Blank		SOLID		F03-006		
R309029-06	Duplicate (R309029-02)	216-A-36B	SOLID		F03-006		07/29/03 08:00

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

QC SUMMARY

SDG 7577

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG H2328

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7577	F03-006-239	B17D43	SOLID	97.8	2.19 g		09/04/03 59		R309029-01	7577-001
		B17D44	SOLID	98.7	2.05 g		09/04/03 37		R309029-02	7577-002
		B17D45	SOLID	98.7	1.72 g		09/04/03 37		R309029-03	7577-003
		Method Blank	SOLID						R309029-05	7577-005
		Lab Control Sample	SOLID						R309029-04	7577-004
		Duplicate (R309029-02)	SOLID	98.7	2.05 g		09/04/03 37		R309029-06	7577-006

QC SUMMARY

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SAMPLE DELIVERY GROUP H2328

SDG 7577

Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford

Contract No. 630

Case no SDG H2328

TEST	MATRIX	METHOD	PREPARATION	ERROR	PLANCHETS ANALYZED				QUALI-		
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG
Alpha Spectroscopy											
AM	SOLID	Americium 241 in Soil	7078-067	5.0	2			1	1	1/1	
NP	SOLID	Neptunium in Soil	7078-067	5.0	2			1	1	1/1	X
PU	SOLID	Plutonium, Isotopic in Solids	7078-067	5.0	2			1	1	1/1	
TH	SOLID	Thorium, Isotopic in Soil	7078-067	5.0	2			1	1	1/1	
U	SOLID	Uranium, Isotopic in Soil	7078-067	5.0	2			1	1	1/1	
Beta Counting											
SR	SOLID	Total Strontium in Soil	7078-067	10.0	2			1	1	1/1	
TC	SOLID	Technetium 99 in Soil	7078-067	10.0	3			1	1	1/1	
Gamma Spectroscopy											
GAM	SOLID	Gamma Scan	7078-067	15.0	2			1	1	1/1	
I	SOLID	Iodine 129 in Soil	7078-067	10.0	3			1	1	1/1	
Kinetic Phosphorimetry (KPA)											
U_T	SOLID	Uranium, Total in Soil	7078-067	9.0	2			1	1	1/1	
Liquid Scintillation Counting											
C	SOLID	Carbon 14 in Soil	7078-067	10.0	3			1	1	1/1	
NI_L	SOLID	Nickel 63 in Soil	7078-067	10.0	3			1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY

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SAMPLE DELIVERY GROUP H2328

SDG 7577

Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford

Contract No. 630

Case no SDG H2328

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	MATRIX SAF No	PLANCHET	TEST	SUF- FIX ANALYZED	REVIEWED	BY	METHOD
R309029-01	B17D43		7577-001	C	10/02/03	10/21/03	MWT	Carbon 14 in Soil
07/07/03	216-A-36B	SOLID	7577-001	I	10/06/03	10/21/03	MWT	Iodine 129 in Soil
09/04/03	F03-006-239	F03-006	7577-001	NI_L	10/02/03	10/21/03	MWT	Nickel 63 in Soil
			7577-001	TC	10/10/03	10/21/03	MWT	Technetium 99 in Soil
R309029-02	B17D44		7577-002	AM	09/30/03	10/21/03	MWT	Americium 241 in Soil
07/29/03	216-A-36B	SOLID	7577-002	C	10/02/03	10/21/03	MWT	Carbon 14 in Soil
09/04/03	F03-006-239	F03-006	7577-002	GAM	10/10/03	10/21/03	MWT	Gamma Scan
			7577-002	I	10/06/03	10/21/03	MWT	Iodine 129 in Soil
			7577-002	NI_L	10/02/03	10/21/03	MWT	Nickel 63 in Soil
			7577-002	NP	09/26/03	10/21/03	MWT	Neptunium in Soil
			7577-002	PU	10/01/03	10/21/03	MWT	Plutonium, Isotopic in Solids
			7577-002	SR	10/02/03	10/21/03	MWT	Total Strontium in Soil
			7577-002	TC	10/10/03	10/21/03	MWT	Technetium 99 in Soil
			7577-002	TH	09/30/03	10/21/03	MWT	Thorium, Isotopic in Soil
			7577-002	U	09/29/03	10/21/03	MWT	Uranium, Isotopic in Soil
			7577-002	U_T	10/16/03	10/21/03	MWT	Uranium, Total in Soil
R309029-03	B17D45		7577-003	AM	09/30/03	10/21/03	MWT	Americium 241 in Soil
07/29/03	216-A-36B	SOLID	7577-003	C	10/03/03	10/21/03	MWT	Carbon 14 in Soil
09/04/03	F03-006-239	F03-006	7577-003	GAM	10/10/03	10/21/03	MWT	Gamma Scan
			7577-003	I	10/07/03	10/21/03	MWT	Iodine 129 in Soil
			7577-003	NI_L	10/02/03	10/21/03	MWT	Nickel 63 in Soil
			7577-003	NP	09/26/03	10/21/03	MWT	Neptunium in Soil
			7577-003	PU	10/01/03	10/21/03	MWT	Plutonium, Isotopic in Solids
			7577-003	SR	10/02/03	10/21/03	MWT	Total Strontium in Soil
			7577-003	TC	10/13/03	10/21/03	MWT	Technetium 99 in Soil
			7577-003	TH	09/30/03	10/21/03	MWT	Thorium, Isotopic in Soil
			7577-003	U	09/29/03	10/21/03	MWT	Uranium, Isotopic in Soil
			7577-003	U_T	10/16/03	10/21/03	MWT	Uranium, Total in Soil

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SAMPLE DELIVERY GROUP H2328

SDG 7577

Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford

Contract No. 630

Case no SDG H2328

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	MATRIX SAF No	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
R309029-04	Lab Control Sample		7577-004	AM		09/30/03	10/21/03	MWT	Americium 241 in Soil
		SOLID	7577-004	C		10/03/03	10/21/03	MWT	Carbon 14 in Soil
		F03-006	7577-004	GAM		10/09/03	10/21/03	MWT	Gamma Scan
			7577-004	I		10/09/03	10/21/03	MWT	Iodine 129 in Soil
			7577-004	NI_L		10/02/03	10/21/03	MWT	Nickel 63 in Soil
			7577-004	NP		09/26/03	10/21/03	MWT	Neptunium in Soil
			7577-004	PU		10/01/03	10/21/03	MWT	Plutonium, Isotopic in Solids
			7577-004	SR		10/02/03	10/21/03	MWT	Total Strontium in Soil
			7577-004	TC		10/10/03	10/21/03	MWT	Technetium 99 in Soil
			7577-004	TH		09/30/03	10/21/03	MWT	Thorium, Isotopic in Soil
			7577-004	U		09/29/03	10/21/03	MWT	Uranium, Isotopic in Soil
			7577-004	U_T		10/16/03	10/21/03	MWT	Uranium, Total in Soil
R309029-05	Method Blank		7577-005	AM		09/30/03	10/21/03	MWT	Americium 241 in Soil
		SOLID	7577-005	C		10/02/03	10/21/03	MWT	Carbon 14 in Soil
		F03-006	7577-005	GAM		10/09/03	10/21/03	MWT	Gamma Scan
			7577-005	I		10/07/03	10/21/03	MWT	Iodine 129 in Soil
			7577-005	NI_L		10/02/03	10/21/03	MWT	Nickel 63 in Soil
			7577-005	NP		09/26/03	10/21/03	MWT	Neptunium in Soil
			7577-005	PU		10/01/03	10/21/03	MWT	Plutonium, Isotopic in Solids
			7577-005	SR		10/02/03	10/21/03	MWT	Total Strontium in Soil
			7577-005	TC		10/13/03	10/21/03	MWT	Technetium 99 in Soil
			7577-005	TH		10/01/03	10/21/03	MWT	Thorium, Isotopic in Soil
			7577-005	U		09/29/03	10/21/03	MWT	Uranium, Isotopic in Soil
			7577-005	U_T		10/16/03	10/21/03	MWT	Uranium, Total in Soil
R309029-06	Duplicate (R309029-02)		7577-006	AM		09/30/03	10/21/03	MWT	Americium 241 in Soil
07/29/03	216-A-36B	SOLID	7577-006	C		10/03/03	10/21/03	MWT	Carbon 14 in Soil
09/04/03		F03-006	7577-006	GAM		10/14/03	10/21/03	MWT	Gamma Scan
			7577-006	I		10/07/03	10/21/03	MWT	Iodine 129 in Soil
			7577-006	NI_L		10/02/03	10/21/03	MWT	Nickel 63 in Soil
			7577-006	NP		09/26/03	10/21/03	MWT	Neptunium in Soil
			7577-006	PU		10/01/03	10/21/03	MWT	Plutonium, Isotopic in Solids
			7577-006	SR		10/02/03	10/21/03	MWT	Total Strontium in Soil
			7577-006	TC		10/11/03	10/21/03	MWT	Technetium 99 in Soil
			7577-006	TH		10/01/03	10/21/03	MWT	Thorium, Isotopic in Soil
			7577-006	U		09/29/03	10/21/03	MWT	Uranium, Isotopic in Soil
			7577-006	U_T		10/16/03	10/21/03	MWT	Uranium, Total in Soil

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

SDG 7577

Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford

Contract No. 630

Case no SDG H2328

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	F03-006	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	2		1	1	1	5
C	F03-006	Carbon 14 in Soil	C14_COX_LSC	3		1	1	1	6
GAM	F03-006	Gamma Scan	GAMMA_GS	2		1	1	1	5
I	F03-006	Iodine 129 in Soil	I129_SEP_LEPS_GS	3		1	1	1	6
NI_L	F03-006	Nickel 63 in Soil	NI63_LSC	3		1	1	1	6
NP	F03-006	Neptunium in Soil	NP237_LLE_PLATE_AEA	2		1	1	1	5
PU	F03-006	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	2		1	1	1	5
SR	F03-006	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	2		1	1	1	5
TC	F03-006	Technetium 99 in Soil	TC99_TR_SEP_LSC	3		1	1	1	6
TH	F03-006	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	2		1	1	1	5
U	F03-006	Uranium, Isotopic in Soil	UIISO_PLATE_AEA	2		1	1	1	5
U_T	F03-006	Uranium, Total in Soil	UTOT_KPA	2		1	1	1	5
TOTALS				28		12	12	12	64

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2328

7577-005

Method Blank

METHOD BLANK

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309029-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7577-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F03-006</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	-0.184	0.54	0.92	50	U	C
Nickel 63	13981-37-8	-0.478	0.54	0.95	30	U	NI_L
Total Strontium	SR-RAD	-0.019	0.13	0.26	1.0	U	SR
Technetium 99	14133-76-7	0.073	0.29	0.47	15	U	TC
Thorium 228	14274-82-9	0.049	0.049	0.062		U	TH
Thorium 230	14269-63-7	0.041	0.049	0.062	1.0	U	TH
Thorium 232	TH-232	0.008	0.016	0.062	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.003	0.007	1.0	U	U_T
Uranium 233/234	U-233/234	-0.003	0.006	0.015	1.0	U	U
Uranium 235	15117-96-1	0	0.008	0.018	1.0	U	U
Uranium 238	U-238	0.003	0.009	0.015	1.0	U	U
Neptunium 237	13994-20-2	0	0.048	0.068	1.0	U	NP
Plutonium 238	13981-16-3	0.040	0.053	0.10	1.0	U	PU
Plutonium 239/240	PU-239/240	0.013	0.027	0.10	1.0	U	PU
Americium 241	14596-10-2	0	0.031	0.12	1.0	U	AM
Iodine 129	15046-84-1	-1.30	1.5	3.5	2.0	U	I
Potassium 40	13966-00-2	U		50		U	GAM
Cobalt 60	10198-40-0	U		2.8	0.050	U	GAM
Tin 126	15832-50-5	U		3.4		U	GAM
Cesium 134	13967-70-9	U		3.3		U	GAM
Cesium 137	10045-97-3	U		2.4	0.10	U	GAM
Radium 226	13982-63-3	U		4.9		U	GAM
Radium 228	15262-20-1	U		19		U	GAM
Europium 152	14683-23-9	U		6.5	0.10	U	GAM
Europium 154	15585-10-1	U		8.6	0.10	U	GAM
Europium 155	14391-16-3	U		5.3	0.10	U	GAM
Thorium 228	14274-82-9	U		3.5		U	GAM
Thorium 232	TH-232	U		19		U	GAM
Uranium 235	15117-96-1	U		7.8		U	GAM

200-PW-2/200-PW-4 OU Borehole Soil

METHOD BLANKS

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Version <u>3.06</u>
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SAMPLE DELIVERY GROUP H2328

Method Blank

BLANK, cont.

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 238	U-238	U		290		U	GAM
Americium 241	14596-10-2	U		6.1		U	GAM

200-PW-2/200-PW-4 OU Borehole Soil

QC-BLANK 45661

METHOD BLANKS

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

7577-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7577</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R309029-04</u> Dept sample id <u>7577-004</u>	Client/Case no <u>Hanford</u> SDG <u>H2328</u> Contract No. <u>630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>F03-006</u>
---	--

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	570	12	2.6	50		C	638	26	89	85-115	80-120
Nickel 63	111	2.2	0.96	30		NI_L	114	4.6	97	84-116	80-120
Total Strontium	19.5	0.85	0.28	1.0		SR	20.9	0.84	93	84-116	80-120
Technetium 99	129	3.2	0.71	15		TC	109	4.4	118	81-119	80-120
Thorium 230	10.1	0.44	0.060	1.0		TH	10.2	0.41	99	88-112	80-120
Total Uranium (ug/g)	1.65	0.19	0.007	1.0		U_T	1.65	0.066	100	77-123	80-120
Uranium 233/234	9.33	0.33	0.14	1.0		U	9.29	0.37	100	89-111	80-120
Uranium 235	7.23	0.28	0.012	1.0		U	7.55	0.30	96	89-111	80-120
Uranium 238	9.94	0.34	0.14	1.0		U	10.1	0.40	98	89-111	80-120
Neptunium 237	9.74	1.0	0.070	1.0		NP	9.92	0.40	98	82-118	80-120
Plutonium 238	12.2	1.5	0.17	1.0		PU	12.1	0.48	101	79-121	80-120
Plutonium 239/240	13.1	1.6	0.17	1.0		PU	13.2	0.53	99	79-121	80-120
Americium 241	9.74	1.2	0.14	1.0		AM	9.52	0.38	102	79-121	80-120
Iodine 129	123	2.3	1.5	2.0		I	116	4.6	106	83-117	80-120
Cobalt 60	220	8.8	5.7	0.050		GAM	227	9.1	97	77-123	80-120
Cesium 137	235	7.3	5.1	0.10		GAM	230	9.2	102	76-124	80-120

200-PW-2/200-PW-4 OU Borehole Soil

QC-LCS 45660

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

7577-006

B17D44

DUPLICATE

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R309029-06</u>	Lab sample id <u>R309029-02</u>	Client sample id <u>B17D44</u>
Dept sample id <u>7577-006</u>	Dept sample id <u>7577-002</u>	Location/Matrix <u>216-A-368</u> <u>SOLID</u>
	Received <u>09/04/03</u>	Collected/Weight <u>07/29/03 08:00</u> <u>2.05 g</u>
% solids <u>98.7</u>	% solids <u>98.7</u>	Custody/SAF No <u>F03-006-239</u> <u>F03-006</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Carbon 14	2.65	9.3	16	50	U	C	12.2	11	18	U	-		
Nickel 63	762	140	190	30		NI_L	917	140	200		18	41	
Total Strontium	85200	940	86	1.0		SR	92100	990	88		8	21	
Technetium 99	1.29	3.1	5.1	15	U	TC	3.44	3.3	6.5	U	-		
Thorium 228	-1.75	3.5	13		U	TH	0.756	2.3	4.6	U	-		
Thorium 230	17.5	11	13	1.0		TH	10.6	6.0	12	U	49	134	
Thorium 232	1.75	3.5	13	1.0	U	TH	0.377	0.75	2.9	U	-		
Total Uranium (ug/g)	35.1	4.0	0.14	1.0		U_T	35.1	4.0	0.14		0	31	
Uranium 233/234	35.0	7.0	3.0	1.0		U	35.0	6.5	3.6		0	42	
Uranium 235	0.382	0.76	2.9	1.0	U	U	2.82	2.1	2.7		152	210	
Uranium 238	12.9	4.4	2.4	1.0		U	12.8	4.1	3.2		1	71	
Neptunium 237	4.64	9.3	14	1.0	UX	NP	0	11	17	U	-		
Plutonium 238	0	7.2	28	1.0	U	PU	2.51	10	24	U	-		
Plutonium 239/240	72.0	29	28	1.0		PU	67.6	26	19		6	84	
Americium 241	43.8	27	26	1.0		AM	37.5	25	24		16	136	
Iodine 129	-4.88	10	23	2.0	U	I	1.33	8.6	20	U	-		
Potassium 40	U		110		U	GAM	U		120	U	-		
Cobalt 60	8.19	4.0	4.2	0.050		GAM	8.34	4.8	5.1		2	118	
Tin 126	U		23		U	GAM	U		25	U	-		
Cesium 134	U		8.8		U	GAM	U		9.8	U	-		
Cesium 137	91600	120	14	0.10		GAM	95100	130	16		4	32	
Radium 226	U		31		U	GAM	U		34	U	-		
Radium 228	U		23		U	GAM	U		26	U	-		
Europium 152	U		76	0.10	U	GAM	U		83	U	-		
Europium 154	U		14	0.10	U	GAM	U		15	U	-		
Europium 155	U		47	0.10	U	GAM	U		51	U	-		
Thorium 228	U		30		U	GAM	U		32	U	-		
Thorium 232	U		23		U	GAM	U		26	U	-		

200-PW-2/200-PW-4 OU Borehole Soil

DUPLICATES

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>10/22/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

7577-006

B17D44

DUPLICATE, cont.

SDG <u>7577</u>		Client/Case no <u>Hanford</u> SDG <u>H2328</u>	
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>	
DUPLICATE		ORIGINAL	
Lab sample id <u>R309029-06</u>	Lab sample id <u>R309029-02</u>	Client sample id <u>B17D44</u>	
Dept sample id <u>7577-006</u>	Dept sample id <u>7577-002</u>	Location/Matrix <u>216-A-368</u> SOLID	
	Received <u>09/04/03</u>	Collected/Weight <u>07/29/03 08:00</u> <u>2.05 g</u>	
% solids <u>98.7</u>	% solids <u>98.7</u>	Custody/SAF No <u>F03-006-239</u> <u>F03-006</u>	

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 235	U		68		U	GAM	U		74	U	-	
Uranium 238	U		620		U	GAM	U		660	U	-	
Americium 241	U		75		U	GAM	U		76	U	-	

200-PW-2/200-PW-4 OU Borehole Soil

QC-DUP#2 45662

DUPLICATES

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2328

7577-001

B17D43

DATA SHEET

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309029-01</u>	Client sample id <u>B17D43</u>	
Dept sample id <u>7577-001</u>	Location/Matrix <u>216-A-36B</u>	<u>SOLID</u>
Received <u>09/04/03</u>	Collected/Weight <u>07/07/03 07:06</u>	<u>2.19 g</u>
% solids <u>97.8</u>	Custody/SAF No <u>F03-006-239</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	116	20	29	50		C
Nickel 63	13981-37-8	181000	2700	<u>940</u>	30		NI_L
Technetium 99	14133-76-7	41.9	4.2	6.4	15		TC
Iodine 129	15046-84-1	<u>-23.5</u>	22	<u>51</u>	2.0	U	I

200-PW-2/200-PW-4 OU Borehole Soil

DATA SHEETS

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2328

7577-002

B17D44

DATA SHEET

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309029-02</u>	Client sample id <u>B17D44</u>	
Dept sample id <u>7577-002</u>	Location/Matrix <u>216-A-36B</u>	<u>SOLID</u>
Received <u>09/04/03</u>	Collected/Weight <u>07/29/03 08:00</u>	<u>2.05 g</u>
% solids <u>98.7</u>	Custody/SAF No <u>F03-006-239</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	12.2	11	18	50	U	C
Nickel 63	13981-37-8	917	140	200	30		NI_L
Total Strontium	SR-RAD	92100	990	88	1.0		SR
Technetium 99	14133-76-7	3.44	3.3	6.5	15	U	TC
Thorium 228	14274-82-9	0.756	2.3	4.6		U	TH
Thorium 230	14269-63-7	10.6	6.0	12	1.0	U	TH
Thorium 232	TH-232	0.377	0.75	2.9	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	35.1	4.0	0.14	1.0		U_T
Uranium 233/234	U-233/234	35.0	6.5	3.6	1.0		U
Uranium 235	15117-96-1	2.82	2.1	2.7	1.0		U
Uranium 238	U-238	12.8	4.1	3.2	1.0		U
Neptunium 237	13994-20-2	0	11	17	1.0	U	NP
Plutonium 238	13981-16-3	2.51	10	24	1.0	U	PU
Plutonium 239/240	PU-239/240	67.6	26	19	1.0		PU
Americium 241	14596-10-2	37.5	25	24	1.0		AM
Iodine 129	15046-84-1	1.33	8.6	20	2.0	U	I
Potassium 40	13966-00-2	U		120		U	GAM
Cobalt 60	10198-40-0	8.34	4.8	5.1	0.050		GAM
Tin 126	15832-50-5	U		25		U	GAM
Cesium 134	13967-70-9	U		9.8		U	GAM
Cesium 137	10045-97-3	95100	130	16	0.10		GAM
Radium 226	13982-63-3	U		34		U	GAM
Radium 228	15262-20-1	U		26		U	GAM
Europium 152	14683-23-9	U		83	0.10	U	GAM
Europium 154	15585-10-1	U		15	0.10	U	GAM
Europium 155	14391-16-3	U		51	0.10	U	GAM
Thorium 228	14274-82-9	U		32		U	GAM
Thorium 232	TH-232	U		26		U	GAM

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2328

7577-002

B17D44

DATA SHEET, cont

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R309029-02</u>	Client sample id <u>B17D44</u>	
Dept sample id <u>7577-002</u>	Location/Matrix <u>216-A-36B</u>	<u>SOLID</u>
Received <u>09/04/03</u>	Collected/Weight <u>07/29/03 08:00</u>	<u>2.05 g</u>
% solids <u>98.7</u>	Custody/SAF No <u>F03-006-239</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 235	15117-96-1	U		74		U	GAM
Uranium 238	U-238	U		660		U	GAM
Americium 241	14596-10-2	U		76		U	GAM

200-PW-2/200-PW-4 OU Borehole Soil

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2328

7577-003

B17D45

DATA SHEET

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309029-03</u>	Client sample id <u>B17D45</u>	
Dept sample id <u>7577-003</u>	Location/Matrix <u>216-A-36B</u>	<u>SOLID</u>
Received <u>09/04/03</u>	Collected/Weight <u>07/29/03 09:15</u>	<u>1.72 g</u>
% solids <u>98.7</u>	Custody/SAF No <u>F03-006-239</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	1.21	8.5	14	50	U	C
Nickel 63	13981-37-8	695	140	<u>190</u>	30		NI_L
Total Strontium	SR-RAD	86700	980	<u>87</u>	1.0		SR
Technetium 99	14133-76-7	1.30	2.7	4.4	15	U	TC
Thorium 228	14274-82-9	1.01	1.5	3.1		U	TH
Thorium 230	14269-63-7	11.4	6.1	<u>11</u>	1.0		TH
Thorium 232	TH-232	0.760	1.0	<u>1.9</u>	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	36.8	4.1	0.14	1.0		U_T
Uranium 233/234	U-233/234	41.2	7.5	<u>3.8</u>	1.0		U
Uranium 235	15117-96-1	1.86	1.5	<u>2.9</u>	1.0	U	U
Uranium 238	U-238	11.1	3.7	<u>2.4</u>	1.0		U
Neptunium 237	13994-20-2	0	10	<u>15</u>	1.0	U	NP
Plutonium 238	13981-16-3	5.02	5.0	<u>19</u>	1.0	U	PU
Plutonium 239/240	PU-239/240	17.5	15	<u>19</u>	1.0	U	PU
Americium 241	14596-10-2	17.9	18	<u>23</u>	1.0	U	AM
Iodine 129	15046-84-1	-14.6	32	<u>75</u>	2.0	U	I
Potassium 40	13966-00-2	U		47		U	GAM
Cobalt 60	10198-40-0	4.01	2.1	<u>2.2</u>	0.050		GAM
Tin 126	15832-50-5	U		27		U	GAM
Cesium 134	13967-70-9	U		5.2		U	GAM
Cesium 137	10045-97-3	68200	90	<u>26</u>	0.10		GAM
Radium 226	13982-63-3	U		33		U	GAM
Radium 228	15262-20-1	U		22		U	GAM
Europium 152	14683-23-9	U		<u>66</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>6.8</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>40</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		27		U	GAM
Thorium 232	TH-232	U		22		U	GAM

200-PW-2/200-PW-4 OU Borehole Soil

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Report date	<u>10/22/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2328

7577-003

B17D45

DATA SHEET, cont

SDG <u>7577</u>	Client/Case no <u>Hanford</u>	SDG <u>H2328</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309029-03</u>	Client sample id <u>B17D45</u>	
Dept sample id <u>7577-003</u>	Location/Matrix <u>216-A-36B</u>	<u>SOLID</u>
Received <u>09/04/03</u>	Collected/Weight <u>07/29/03 09:15</u>	<u>1.72 g</u>
% solids <u>98.7</u>	Custody/SAF No <u>F03-006-239</u>	<u>F03-006</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 235	15117-96-1	U		55		U	GAM
Uranium 238	U-238	U		380		U	GAM
Americium 241	14596-10-2	U		82		U	GAM

200-PW-2/200-PW-4 OU Borehole Soil

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Lab id <u>EBRLNE</u>
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test AM Matrix SOLID

SDG 7577

Contact Melissa C. Mannion

LAB METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford

Contract No. 630

Contract SDG H2328

RESULTS

LAB	RAW	SUF-		Americium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	241

Preparation batch 7078-067

R309029-02	7577-002	B17D44	37.5
R309029-03	7577-003	B17D45	17.9 U
R309029-04	7577-004	LCS (QC ID=45660)	ok
R309029-05	7577-005	BLK (QC ID=45661)	U
R309029-06	7577-006	Duplicate (R309029-02)	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED

Preparation batch 7078-067 2σ prep error 5.0 % Reference Lab Notebook 7078 pg. 067

R309029-02	B17D44	24	0.0050	76	107	63	09/30/03	09/30	SS-055
R309029-03	B17D45	23	0.0050	81	107	63	09/30/03	09/30	SS-056
R309029-04	LCS (QC ID=45660)	0.14	1.00	68	107		09/30/03	09/30	SS-057
R309029-05	BLK (QC ID=45661)	0.12	1.00	79	107		09/30/03	09/30	SS-060
R309029-06	Duplicate (R309029-02) (QC ID=45662)	26	0.0050	72	107	63	09/30/03	09/30	SS-062

Nominal values and limits from method 1.0 1.00 20-105 100 100 180

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
CP-061	Determination of Moisture Content in Solid Samples, rev 1	
CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5	
CP-960	Americium-Curium Purification, Large Aliquot, rev 4	
CP-008	Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD	MDA 15 ± 27
FOR 5 SAMPLES	YIELD 75 ± 11

METHOD SUMMARIES

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Protocol Hanford
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Report date 10/22/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test NP Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB RAW SUF- Neptunium
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 237

Preparation batch 7078-067

R309029-02	7577-002	B17D44	U
R309029-03	7577-003	B17D45	U
R309029-04	7577-004	LCS (QC ID=45660)	ok
R309029-05	7577-005	BLK (QC ID=45661)	U
R309029-06	7577-006	Duplicate (R309029-02)	- UX

Nominal values and limits from method RDLs (pCi/g) 1.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7078-067 2σ prep error 5.0 % Reference Lab Notebook 7078 pg. 067

R309029-02	B17D44	17	0.0050	44	269	59	09/25/03	09/26	SS-058
R309029-03	B17D45	15	0.0050	46	112	59	09/25/03	09/26	SS-041
R309029-04	LCS (QC ID=45660)	0.070	1.00	50	112		09/25/03	09/26	SS-042
R309029-05	BLK (QC ID=45661)	0.068	1.00	50	112		09/25/03	09/26	SS-035
R309029-06	Duplicate (R309029-02)	14	0.0050	54	112	59	09/25/03	09/26	SS-036
	(QC ID=45662)								

Nominal values and limits from method 1.0 1.00 20-105 100 180

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
CP-061	Determination of Moisture Content in Solid Samples, rev 1	
CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5	
CP-930	Neptunium from Solids and Water by Extraction Chromatography, rev 0	
CP-008	Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD	MDA	9.2 ± 17
FOR 5 SAMPLES	YIELD	49 ± 8

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 10/22/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test PU Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB	RAW	SUF-		Plutonium	Plutonium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	238	239/240
Preparation batch 7078-067					
R309029-02		7577-002	B17D44	2.51 U	67.6
R309029-03		7577-003	B17D45	5.02 U	17.5 U
R309029-04		7577-004	LCS (QC ID=45660)	ok	ok
R309029-05		7577-005	BLK (QC ID=45661)	U	U
R309029-06		7577-006	Duplicate (R309029-02)	- U	ok

Nominal values and limits from method RDLs (pCi/g) 1.0 1.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-		MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID		pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7078-067				2σ prep error 5.0 %		Reference Lab Notebook 7078 pg. 067										
R309029-02		B17D44		24	0.0050			75		175		64	10/01/03	10/01	SS-039	
R309029-03		B17D45		19	0.0050			70		175		64	10/01/03	10/01	SS-040	
R309029-04		LCS (QC ID=45660)		0.17	1.00			53		106			10/01/03	10/01	SS-028	
R309029-05		BLK (QC ID=45661)		0.10	1.00			81		118			10/01/03	10/01	SS-055	
R309029-06		Duplicate (R309029-02)		28	0.0050			60		118		64	10/01/03	10/01	SS-056	
(QC ID=45662)																

Nominal values and limits from method 1.0 1.00 20-105 100 100 180

PROCEDURES REFERENCE PUIISO_PLATE_AEA
CP-061 Determination of Moisture Content in Solid Samples, rev 1
CP-070 Soil Dissolution, < 1.0g Aliquot, rev 5
CP-941 Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
CP-008 Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD MDA 14 ± 27
FOR 5 SAMPLES YIELD 68 ± 23

METHOD SUMMARIES

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Lab id EBRLNE
Protocol Hanford
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Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test TH Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Thorium 230

Preparation batch 7078-067

R309029-02	7577-002	B17D44	10.6	U
R309029-03	7577-003	B17D45	11.4	
R309029-04	7577-004	LCS (QC ID=45660)	ok	
R309029-05	7577-005	BLK (QC ID=45661)	U	
R309029-06	7577-006	Duplicate (R309029-02)	ok	

Nominal values and limits from method RDLs (pCi/g) 1.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED

Preparation batch 7078-067 2σ prep error 5.0 % Reference Lab Notebook 7078 pg. 067

R309029-02	B17D44	12	0.0050	88	918	63	09/30/03	09/30	SS-063
R309029-03	B17D45	11	0.0050	115	919	63	09/30/03	09/30	SS-065
R309029-04	LCS (QC ID=45660)	0.060	1.00	89	919		09/30/03	09/30	SS-066
R309029-05	BLK (QC ID=45661)	0.062	1.00	90	176		09/30/03	10/01	SS-041
R309029-06	Duplicate (R309029-02)	13	0.0050	85	176	64	09/30/03	10/01	SS-042
	(QC ID=45662)								

Nominal values and limits from method 1.0 1.00 20-105 150 180

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
CP-061	Determination of Moisture Content in Solid Samples, rev 1	
CP-070	Soil Dissolution, < 1.0g Aliquot, rev 5	
CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1	
CP-008	Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD	MDA	7.2 ± 13
FOR 5 SAMPLES	YIELD	93 ± 24

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test U Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB	RAW	SUF-		1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	233/234	235	238	1÷3	2σ	2÷3	2σ
Preparation batch 7078-067										
R309029-02		7577-002	B17D44	35.0	2.82	12.8	273	101	22	18
R309029-03		7577-003	B17D45	41.2	1.86 U	11.1	371	141	17	15
R309029-04		7577-004	LCS (QC ID=45660)	ok	ok	ok				
R309029-05		7577-005	BLK (QC ID=45661)	U	U	U				
R309029-06		7577-006	Duplicate (R309029-02)	ok	ok U	ok	271	107	3	6
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100	4	
200-PW-2/200-PW-4 OU Borehole Soil								Averages 305	14	

METHOD PERFORMANCE

LAB	RAW	SUF-		MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID		pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 7078-067				2σ prep error 5.0 %				Reference Lab Notebook 7078 pg. 067						
R309029-02		B17D44		3.6	0.0050			85		1039			62 09/26/03 09/29	SS-056
R309029-03		B17D45		3.8	0.0050			84		1039			62 09/26/03 09/29	SS-057
R309029-04		LCS (QC ID=45660)		0.14	1.00			95		1038			09/26/03 09/29	SS-060
R309029-05		BLK (QC ID=45661)		0.018	1.00			80		1039			09/26/03 09/29	SS-062
R309029-06		Duplicate (R309029-02)		3.0	0.0050			84		1041			62 09/26/03 09/29	SS-066
(QC ID=45662)														
Nominal values and limits from method				1.0	1.00			20-105		100	100	180		

PROCEDURES REFERENCE UIISO_PLATE_AEA
CP-061 Determination of Moisture Content in Solid Samples, rev 1
CP-070 Soil Dissolution, < 1.0g Aliquot, rev 5
CP-921 Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 0
CP-008 Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD MDA 2.1 ± 3.8
FOR 5 SAMPLES YIELD 86 ± 11

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test SR Matrix SOLID

SDG 7577

Contact Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford

Contract No. 630

Contract SDG H2328

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium

Preparation batch 7078-067

R309029-02		7577-002	B17D44	92100
R309029-03		7577-003	B17D45	86700
R309029-04		7577-004	LCS (QC ID=45660)	ok
R309029-05		7577-005	BLK (QC ID=45661)	U
R309029-06		7577-006	Duplicate (R309029-02)	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED

Preparation batch 7078-067 2σ prep error 10.0 % Reference Lab Notebook 7078 pg. 067

R309029-02		B17D44	88	0.0050			84	100				65	10/02/03
R309029-03		B17D45	87	0.0050			81	100				65	10/02/03
R309029-04		LCS (QC ID=45660)	0.28	1.00			93	100					10/02/03
R309029-05		BLK (QC ID=45661)	0.26	1.00			89	100					10/02/03
R309029-06		Duplicate (R309029-02)	86	0.0050			88	100				65	10/02/03
		(QC ID=45662)											

Nominal values and limits from method 1.0 1.00 30-105 100 180

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
CP-061		Determination of Moisture Content in Solid Samples, rev 1
CP-070		Soil Dissolution, < 1.0g Aliquot, rev 5
CP-383		Strontium in Dissolved Solid of < 5.0g Aliquot, rev 0

AVERAGES ± 2 SD	MDA	52	±	95
FOR 5 SAMPLES	YIELD	87	±	9

METHOD SUMMARIES

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Protocol Hanford

Version Ver 1.0

Form DVD-LMS

Version 3.06

Report date 10/22/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test TC Matrix SOLID

SDG 7577

Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Client Hanford

Contract No. 630

Contract SDG H2328

RESULTS

LAB	RAW	SUF-	Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID
			99

Preparation batch 7078-067

R309029-01	7577-001	B17D43	41.9
R309029-02	7577-002	B17D44	U
R309029-03	7577-003	B17D45	U
R309029-04	7577-004	LCS (QC ID=45660)	ok
R309029-05	7577-005	BLK (QC ID=45661)	U
R309029-06	7577-006	Duplicate (R309029-02)	- U

Nominal values and limits from method RDLs (pCi/g) 15
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED
													YZED
													DETECTOR

Preparation batch 7078-067 2σ prep error 10.0 % Reference Lab Notebook 7078 pg. 067

R309029-01	B17D43	6.4	0.100	84	50	95	10/07/03	10/10	GRB-221
R309029-02	B17D44	6.5	0.100	78	50	73	10/07/03	10/10	GRB-222
R309029-03	B17D45	4.4	0.110	80	82	76	10/07/03	10/13	GRB-222
R309029-04	LCS (QC ID=45660)	0.71	1.00	75	50		10/07/03	10/10	GRB-224
R309029-05	BLK (QC ID=45661)	0.47	1.00	86	82		10/07/03	10/13	GRB-224
R309029-06	Duplicate (R309029-02)	5.1	0.100	73	95	74	10/07/03	10/11	GRB-207
	(QC ID=45662)								

Nominal values and limits from method 15 1.00 20-105 50 180

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
CP-021	Preparation of Tc-99m Tracer, rev 2	
CP-003	Addition of Carriers and Tracers, rev 5	
CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 0	

AVERAGES ± 2 SD	MDA	3.9 ± 5.4
FOR 6 SAMPLES	YIELD	79 ± 10

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Protocol	Hanford
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Form	DVD-LMS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test GAM Matrix SOLID
 SDG 7577
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN
 GAMMA SPECTROSCOPY

Client Hanford
 Contract No. 630
 Contract SDG H2328

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137

Preparation batch 7078-067

R309029-02		7577-002	B17D44	8.34	95100
R309029-03		7577-003	B17D45	4.01	68200
R309029-04		7577-004	LCS (QC ID=45660)	ok	ok
R309029-05		7577-005	Method Blank	U	U
R309029-06		7577-006	Duplicate (R309029-02)	ok	ok

Nominal values and limits from method RDLs (pCi/g) 0.050 0.10
 200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR

Preparation batch 7078-067 2σ prep error 15.0 % Reference Lab Notebook 7078 pg. 067

R309029-02		B17D44	190	0.906					417			73	10/01/03	10/10	CP,07,00
R309029-03		B17D45	190	0.927					1000			73	10/01/03	10/10	CP,03,00
R309029-04		LCS (QC ID=45660)	5.7	1.00					524				10/01/03	10/09	SP,07,00
R309029-05		Method Blank	19	1.00					545				10/01/03	10/09	SP,03,00
R309029-06		Duplicate (R309029-02)	180	0.906					475			77	10/01/03	10/14	CP,07,00

Nominal values and limits from method 0.050 1.00 100 180

PROCEDURES	REFERENCE	GAMMA_GS
CP-061		Determination of Moisture Content in Solid Samples, rev 1
CP-100		Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD MDA 120 ± 190
 FOR 5 SAMPLES YIELD ±

METHOD SUMMARIES

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 Protocol Hanford
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test I Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN SOIL
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Iodine 129

Preparation batch 7078-067

R309029-01	7577-001	B17D43	U
R309029-02	7577-002	B17D44	U
R309029-03	7577-003	B17D45	U
R309029-04	7577-004	LCS (QC ID=45660)	ok
R309029-05	7577-005	BLK (QC ID=45661)	U
R309029-06	7577-006	Duplicate (R309029-02)	- U

Nominal values and limits from method RDLs (pCi/g) 2.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7078-067 2σ prep error 10.0 % Reference Lab Notebook 7078 pg. 067

R309029-01	B17D43	51	0.110	38	964	91	10/04/03	10/06	XSPEC-016
R309029-02	B17D44	20	0.110	38	603	69	10/04/03	10/06	XSPEC-004
R309029-03	B17D45	75	0.100	30	603	70	10/04/03	10/07	XSPEC-016
R309029-04	LCS (QC ID=45660)	1.5	1.00	76	245		10/04/03	10/09	XSPEC-004
R309029-05	BLK (QC ID=45661)	3.5	1.00	67	659		10/04/03	10/07	XSPEC-016
R309029-06	Duplicate (R309029-02)	23	0.110	35	660	70	10/04/03	10/07	XSPEC-004
	(QC ID=45662)								

Nominal values and limits from method 2.0 1.00 20-105 300 180

PROCEDURES REFERENCE I129_SEP_LEPS_GS
CP-024 Iodine-129, Sample Dissolution, rev 3
CP-530 Iodine-129 Purification, rev 0

AVERAGES ± 2 SD MDA 29 ± 57
FOR 6 SAMPLES YIELD 47 ± 38

METHOD SUMMARIES

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Lab id EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test U I Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY (KPA)

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Uranium
Preparation batch 7078-067				
R309029-02		7577-002	B17D44	35.1
R309029-03		7577-003	B17D45	36.8
R309029-04		7577-004	LCS (QC ID=45660)	ok
R309029-05		7577-005	BLK (QC ID=45661)	U
R309029-06		7577-006	Duplicate (R309029-02)	ok

Nominal values and limits from method RDLs (ug/g) 1.0
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	ug/g	g	FAC	TION	%	%	min	keV	keV	HELD PREPARED	YZED DETECTOR
Preparation batch 7078-067					2σ prep error 9.0 % Reference Lab Notebook 7078 pg. 067								
R309029-02		B17D44	0.14	0.0050								79 10/16/03 10/16	KPA-001
R309029-03		B17D45	0.14	0.0050								79 10/16/03 10/16	KPA-001
R309029-04		LCS (QC ID=45660)	0.007	1.00								10/16/03 10/16	KPA-001
R309029-05		BLK (QC ID=45661)	0.007	0.100								10/16/03 10/16	KPA-001
R309029-06		Duplicate (R309029-02)	0.14	0.0050								79 10/16/03 10/16	KPA-001
		(QC ID=45662)											

Nominal values and limits from method 1.0 0.100 180

PROCEDURES	REFERENCE	UTOT_KPA
CP-061		Determination of Moisture Content in Solid Samples, rev 1
CP-070		Soil Dissolution, < 1.0g Aliquot, rev 5
CP-044		Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
CP-928		Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD MDA 0.087 ± 0.15
FOR 5 SAMPLES YIELD ±

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test C Matrix SOLID
 SDG 7577
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

CARBON 14 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H2328

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Carbon 14

Preparation batch 7078-067

R309029-01	7577-001	B17D43	116
R309029-02	7577-002	B17D44	U
R309029-03	7577-003	B17D45	U
R309029-04	7577-004	LCS (QC ID=45660)	ok
R309029-05	7577-005	BLK (QC ID=45661)	U
R309029-06	7577-006	Duplicate (R309029-02)	- U

Nominal values and limits from method RDLs (pCi/g) 50
 200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-				
SAMPLE ID	TEST	FIX	CLIENT	SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR

Preparation batch 7078-067 2σ prep error 10.0 % Reference Lab Notebook 7078 pg. 067

R309029-01	B17D43	29	<u>0.0326</u>	100	100	87	10/01/03	10/02	LSC-005
R309029-02	B17D44	18	<u>0.0484</u>	100	100	65	10/01/03	10/02	LSC-005
R309029-03	B17D45	14	<u>0.0624</u>	100	100	66	10/01/03	10/03	LSC-005
R309029-04	LCS (QC ID=45660)	2.6	1.00	100	<u>11</u>		10/01/03	10/03	LSC-005
R309029-05	BLK (QC ID=45661)	0.92	1.00	100	100		10/01/03	10/02	LSC-005
R309029-06	Duplicate (R309029-02)	16	<u>0.0596</u>	100	100	66	10/01/03	10/03	LSC-005
	(QC ID=45662)								

Nominal values and limits from method 50 1.00 50 180

PROCEDURES REFERENCE C14_COX_LSC
 CP-251 Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD MDA 13 ± 21
 FOR 6 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

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 Form DVD-LMS
 Version 3.06
 Report date 10/22/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2328

Test NI L Matrix SOLID
SDG 7577
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2328

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 7078-067

R309029-01	7577-001	B17D43	181000
R309029-02	7577-002	B17D44	917
R309029-03	7577-003	B17D45	695
R309029-04	7577-004	LCS (QC ID=45660)	ok
R309029-05	7577-005	BLK (QC ID=45661)	U
R309029-06	7577-006	Duplicate (R309029-02)	ok

Nominal values and limits from method RDLs (pCi/g) 30
200-PW-2/200-PW-4 OU Borehole Soil

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7078-067 2σ prep error 10.0 % Reference Lab Notebook 7078 pg. 067

R309029-01	B17D43	940	0.0010	99	100	87	10/01/03	10/02	LSC-005
R309029-02	B17D44	200	0.0050	98	100	65	10/01/03	10/02	LSC-005
R309029-03	B17D45	190	0.0050	98	100	65	10/01/03	10/02	LSC-005
R309029-04	LCS (QC ID=45660)	0.96	1.00	99	100		10/01/03	10/02	LSC-005
R309029-05	BLK (QC ID=45661)	0.95	1.00	99	100		10/01/03	10/02	LSC-005
R309029-06	Duplicate (R309029-02)	190	0.0050	99	100	65	10/01/03	10/02	LSC-005
	(QC ID=45662)								

Nominal values and limits from method 30 1.00 30-105 50 180

PROCEDURES REFERENCE NI63_LSC
CP-061 Determination of Moisture Content in Solid Samples, rev 1
CP-070 Soil Dissolution, < 1.0g Aliquot, rev 5
CP-280 Nickel-63 Purification, rev 0

AVERAGES ± 2 SD MDA 250 ± 700
FOR 6 SAMPLES YIELD 99 ± 1

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REPORT GUIDE

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SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
 - B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
 - H Similar to 'L' except the recovery was high.
 - P The RESULT is 'preliminary'.
 - X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
 - 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result, prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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SUMMARY DATA SECTION

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Lab id EBRINE

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Version Ver 1.0

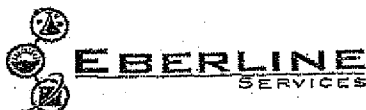
Form DVD-RG

Version 3.06

Report date 10/22/03

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-239		Page 1 of 1	
Collector Pope/Pfister/Hughes		Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		Price Code 8N	
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		Sampling Location 216-A-36B		H2328 (7577)		SAF No. F03-006		Air Quality <input type="checkbox"/>	
Ice Chest No. <u>ERC 03 102</u>		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express			
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. <u>RSR 106702 & 106703</u>		Bill of Lading/Air Bill No. <u>N/A</u>					
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage				Preservation	None	None			
				Type of Container	G	G			
				No. of Container(s)	1	1			
				Volume	15mL	15g			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.				
Sample No.	Matrix *	Sample Date	Sample Time						
B17D43	SOIL	7-7-03	0706	X				B17487	
B17D44	SOIL	7-29-03	0800		X			B17976	
B17D45	SOIL	7-29-03	0915		X			B17016	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>The lab is to achieve a detection limit of 50.0 pCi/g for C-14. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.</p> <p>(1) Technetium-99, Strontium-90, Total Sr, Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237</p> <p>(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Cesium-134, Radium-226, Radium-228, Tin-126); Total Uranium; Americium-241; Isotopic Plutonium; Isotopic Uranium, Technetium-99, Sr-90, 90 Total Sr, Isotopic Thorium (Thorium-232) Carbon-14, Iodine-129, Nickel-63, Neptunium-237</p> <p>personnel not available to relinquish samples from 3728 Ref # 1A on 9/3/03</p> <p>Repackaged to the following volumes: B17487 - 2.19g B17976 - 2.05g B17016 - 1.72g</p>	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			

Room 127



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

ON HOLD

Client: FLR Date/Time received 1000 9-4-03

CoC No. F03-006-239

Container I.D. No. 621-03-102 Requested TAT (Days) 45 P.O. Received Yes [] No []

INSPECTION

- Custody seals on shipping container intact? Yes [☒] No [] N/A []
- Custody seals on shipping container dated & signed? Yes [☒] No [] N/A []
- Custody seals on sample containers intact? Yes [☒] No [] N/A []
- Custody seals on sample containers dated & signed? Yes [☒] No [] N/A []
- Packing material is: Wet [] Dry [☒]
- Number of samples in shipping container: 3
- Number of containers per sample: 1 (Or see CoC _____)
- Samples are in correct container Yes [☒] No []
- Paperwork agrees with samples? Yes [☒] No []
- Samples have: Tape [☒] Hazard labels [] Rad labels [] Appropriate sample labels []
- Samples are: In good condition [☒] Leaking [] Broken Container [] Missing []
- Samples are: Preserved [] Not preserved [☒] pH _____ Preservative _____
- Describe any anomalies: _____
- Was P.M. notified of any anomalies? Yes [] No [] Date _____
- Received by [Signature] Date: 9-4-03 Time: 1000

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
<u>B17D43</u>	<u>4000</u>						
<u>B17D44</u>	<u>2000</u>						
<u>B17D45</u>	<u>1500</u>						

Ion Chamber Ser. No. _____

Calibration date _____

Alpha Meter Ser. No. _____

Calibration date _____

Beta/Gamma Meter Ser. No. 100482Calibration date 6-24-03